

## Arc Suppression Coatings, Phase I

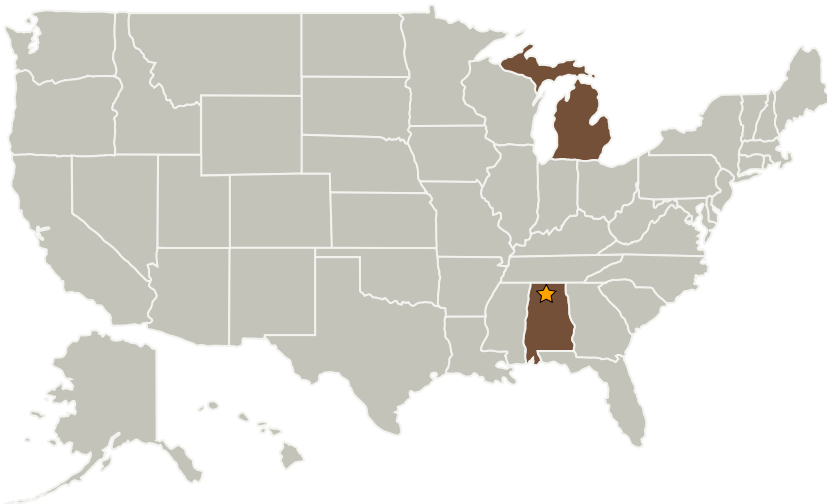
Completed Technology Project (2006 - 2006)



## Project Introduction

In order to support systems such as the Momentum Exchange/Electrodynamic Reboost (MXER) Tether, NASA has identified the need for advanced electrodynamic-tether materials. A recently identified concern with present tether materials, particularly illustrated by the arcing after the tether break during the TSS-1R mission, is the need for arc suppression in the event that the insulation is breached by orbital debris and/or micrometeoroids. This concern applies to any high voltage application, including solar arrays, electric thruster components, and various scientific instruments. A significant hazard in and of itself to the tether application, the impact of the debris may release ionized and neutral particles which can instigate electrical arcing to the surrounding plasma, further weakening or severing the tether. The research program proposed here will identify, develop, and test advanced coatings for electrodynamic tethers that will suppress arc generation should the coating be breached. The proposed mechanism for suppressing the arc is including in the coating an encapsulated or entrapped electronegative gas that is released during the insulation breach and arcing event.

## Primary U.S. Work Locations and Key Partners



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## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Marshall Space Flight Center (MSFC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
ElectroDynamic Applications, Inc.	Supporting Organization	Industry Minority-Owned Business	Ann Arbor, Michigan

## Primary U.S. Work Locations

Alabama	Michigan
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - └ TX01.4 Advanced Propulsion
    - └ TX01.4.2 Electromagnetic Tethers